

other, by Mr. C. Reid, announcing the discovery in the "elk-marl" of Lough Gur of remains of the submerged flowering plant *Naias marina*. The new liverwort, curiously enough, appears to be very similar to a species from Tierra del Fuego. The *Naias*, we may remind our readers, is now found living only in one spot in Great Britain, namely, Hickling Broad, but has been found fossil in several localities, although it was hitherto totally unknown in Ireland.

SEVERAL pamphlets dealing with forestry problems have been received from the United States Department of Agriculture. Discussing the future supply of railroad ties, Mr. H. von Schrenck, in a *Bulletin*, shows that timber of inferior quality is rendered as durable as that of a better quality by treatment with suitable preservative substances. A recent process, which is still in the experimental stage, makes use of a strong sugar solution in which the timber is boiled. With the adoption of softer timber, the method of fastening the rails requires consideration, and the respective forms of spikes, plates, and dowels are contrasted. In a *Bulletin* on the planting of white pine, Mr. H. B. Kempton compares the results obtained on four different woodlots, from which it is concluded that the expense of laying out a pure white pine plantation is considerable, but this may be reduced by planting less expensive seedlings, such as sugar maple, between, and these are cut down when thinning is required.

"A CRITICAL Revision of the Genus *Eucalyptus*" is the title of a memoir by Mr. J. H. Maiden, director of the Sydney Botanic Gardens, which has reached the fourth part. Two species, *Eucalyptus incrassata* and *Eucalyptus foecunda*, with varieties, are described and figured in a number of plates.

The extension section of the Manchester Microscopical Society has just issued an attractive list of popular science lectures (fifty-four in all) which have been arranged for delivery by its members during the coming winter. The object of the scheme is to bring scientific knowledge, in a popular form, before societies which are unable to pay large fees to professional lecturers, the work of lecturing and demonstrating being gratuitous on the part of the members.

THE Department of the Interior of Canada has recently issued a "Dictionary of Altitudes in the Dominion of Canada," by James White, the work being a supplement to that author's "Altitudes in Canada." The arrangement is alphabetical, by provinces and territories, and the volume should be of service to engineers, surveyors, and others who wish to know the altitude of any place in the dominion.

VOL. i. of the second series of the *Proceedings* of the London Mathematical Society, which has just been published by Mr. F. Hodgson, of Farringdon Street, contains obituary notices of Profs. L. Cremona, G. Salmon, J. Willard Gibbs, and Mr. G. H. Stuart, in addition to the papers read before the society from January, 1903, to February, 1904.

THE volume for 1903 of the *Journal and Proceedings* of the Royal Society of New South Wales has just reached us. It is issued in this country by George Robertson and Co., of 17 Warwick Square, E.C.

WE have received a copy of a catalogue (published by Rae Brothers, Melbourne) of the fine collection of eggs and nests of Australian birds in the possession of Mr. D. le Souëf, director of the Melbourne Zoological Gardens.

NO. 1816, VOL. 70]

## OUR ASTRONOMICAL COLUMN.

THE RETURN OF TEMPEL'S SECOND (1873) COMET.—The comet Tempel<sub>2</sub> (1873), which has a period of about 5.28 years, made its last perihelion passage on July 28, 1899, and should, therefore, reappear during the later months of the present year. Although this object will be but of feeble intensity throughout the apparition, it should certainly be observable, therefore M. J. Coniel, of the Paris Bureau des Longitudes, has calculated a daily ephemeris for it from the following elements, which were computed by Mr. Schulof. This ephemeris, an extract from which is given below, covers the period July 29—October 25, and is published in No. 3962 of the *Astronomische Nachrichten*.

Epoch 1904 October 30<sup>0</sup> M.T. Paris.

$$\begin{aligned} M &= 357^{\circ} 51' 49'' \\ \infty &= 185^{\circ} 44' 39'' \\ \Omega &= 120^{\circ} 59' 52'' \\ i &= 12^{\circ} 38' 55'' \\ \phi &= 32^{\circ} 50' 37'' \\ \mu &= 672'' \cdot 175 \\ \log a &= 0 \cdot 41868 \end{aligned} \quad 1904^0$$

In computing these elements the perturbations of Jupiter and Saturn have been taken into account.

### Ephemeris 12h. (M.T. Paris).

1904		$\alpha$ (app.) h. m. s.	$\delta$ (app.) ° ' "	$\log \Delta$
Aug. 17	...	14 23 45	-4 9 10	0.2242
" 21	...	14 31 13	-5 17 34	0.2268
" 25	...	14 39 4	-6 26 33	0.2292
" 29	...	14 47 17	-7 35 56	0.2315
Sept. 2	...	14 55 53	-8 45 31	0.2336
" 6	...	15 4 51	-9 55 4	0.2356

SPECTRA OF NEPTUNE AND URANUS.—The results of a photographic study of the spectra of Neptune and Uranus are given in No. 13 of the Lowell Observatory *Bulletins* by Mr. V. M. Slipher, reproductions of the photographs being given on an accompanying plate.

The spectrogram of Neptune extends from  $\lambda$  4300 to D, and is compared with that of the solar type star  $\beta$  Geminorum. There is an apparent brightening, in the planetary spectrum, on the more refrangible side of  $b$  which seems to indicate intrinsic emission, but may be due to the contrast afforded by two strong absorption bands. H $\beta$  is stronger in the Neptunian spectrum, and one photograph shows H $\gamma$  stronger, thereby indicating the presence of free hydrogen in the planet's atmosphere.

The spectrum of Uranus from F to  $\lambda$  350 exhibits no departure from the normal solar spectrum, but on one photograph there is apparently a line in the position of D<sub>3</sub>, indicating, if real, the presence of helium.

A comparison of the two spectra shows that although free hydrogen is present, in the atmosphere of Uranus it is not so abundant as in that of the outer planet. Three bands situated at  $\lambda$  510,  $\lambda$  543, and  $\lambda$  577, respectively, are also stronger in the spectrum of the latter, thereby indicating that the atmosphere of Neptune is much more extensive than that of Uranus. The origins of these bands are at present unknown, unless the second and third are due to water-vapour, and Mr. Slipher suggests that they may be due to gases lighter than, but similar to, hydrogen and helium, which have not been recorded in stellar spectra because the temperature conditions in stars are, probably, unfavourably high.

THE VARIABLE RADIAL VELOCITY OF  $\delta$  ORIONIS.—In a recent paper, Prof. Hartmann pointed out that the value which he obtained for the period of the "oscillations" of  $\delta$  Orionis did not agree with those previously published by M. Deslandres.

The latter observer now shows, in No. 3963 of the *Astronomische Nachrichten*, that although the results are divergent the observations are confirmatory, for his result was based on very few observations, and is exactly one-third of the value obtained by Prof. Hartmann, the numbers being 1.92 and 5.73 (days) respectively. Prof. Pickering pointed out some time ago that periods of variable radial velocity which are derived from few observations are

likely to produce acceptable values, which may, however, be multiples or submultiples of the true values.

The intensity of the Meudon spectrograms about the region  $\lambda$  393 is not sufficient to confirm, or refute, the observation of Prof. Hartmann that the "K" (calcium) line does not appear to share in the periodic displacements of the other lines in the spectrum.

THE SOLAR SURFACE DURING 1903.—The annual report of the observations of solar phenomena made at the Lyons Observatory during 1903 appears in the August number of the *Bulletin de la Société astronomique de France*, wherein M. J. Guillaume gives comparative tables showing the numbers, areas, and distribution of spots and faculae for the years 1900–1903 inclusive.

Of the 260 observing days in 1903 there were only thirty-eight on which "no spots" was recorded. Both the numbers and areas of spots show a marked increase on the previous year, the figures being 1902, 33 and 1785 millionths, and 1903, 115 and 8440 millionths. The mean latitude, for both hemispheres, during 1903 was  $10^{\circ}3'$ , in place of  $15^{\circ}9'$  and  $21^{\circ}2'$  for 1901 and 1902 respectively.

The groups of faculae were fewer in number during 1903 than in 1902 (324 and 363 respectively), but their total area was a little more than twice as great (204.1 and 97.6 thousandths respectively), whilst their mean latitude was  $27^{\circ}8'$ , as compared with  $38^{\circ}8'$  in 1902, and  $35^{\circ}8'$  in 1901.

The preponderance of spots in the northern hemisphere remarked in 1901 and 1902 changed over to the southern hemisphere in 1903, the total areas during last year being S. 507.1 millionths, N. 336.9 millionths.

From the tables showing their distribution in latitude and longitude, one sees that the greatest augmentations of both spots and faculae, in each hemisphere, took place in the same zones.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Dr. Wm. Osler, F.R.S., has, with the King's approval, been appointed regius professor of medicine in succession to Sir John Burdon Sanderson, Bart., F.R.S. Prof. Osler has, since 1889, filled the chair of the principles and practice of medicine at Johns Hopkins University, Baltimore.

CAMBRIDGE.—In connection with the visit of the British Association, the degree of Doctor of Science, *honoris causa*, will on August 22 be conferred on the following:—J. O. Backlund, director of the Pulkova Observatory; Prof. H. Becquerel, Paris; Prof. J. W. Brühl, Heidelberg; Prof. A. Engler, Berlin; Prof. P. H. von Groth, Munich; P. Kabbadias, Athens; Prof. A. Kossel, Heidelberg; Prof. H. F. Osborn, New York; N. G. Pierson, Amsterdam; Prof. V. Volterra, Rome; Sir David Gill, K.C.B., F.R.S.; A. W. Howitt, the Australian anthropologist; Sir Norman Lockyer, K.C.B., F.R.S.; Major P. A. MacMahon, F.R.S.; Sir W. Ramsay, K.C.B., F.R.S.; Prof. A. Schuster, F.R.S.; Sir W. T. Thiselton-Dyer, K.C.M.G., F.R.S.

The first list of successful candidates for the university diploma in tropical medicine and hygiene has just been issued by the examiners (Sir P. Manson, Major Ross, and Dr. Nuttall). It includes the following:—A. R. Cleveland, A. R. J. Douglas, G. Elliott, P. N. Gerrard, C. M. Heanley, J. C. B. Satham, C. A. Suvoong, and J. C. Thompson.

Mr. S. A. McDowall, Trinity, has been appointed assistant to the superintendent of the Museum of Zoology (Dr. S. F. Harmer).

DR. ALBERT S. GRUNBAUM, lecturer in experimental medicine at the University of Liverpool, and director of cancer research at Liverpool, has been appointed professor of pathology and bacteriology in the University of Leeds in the place of Prof. Trevelyan, who is retiring. Dr. George Wilson has been appointed to the newly created lectureship in civil engineering in the same university.

THE syllabus for 1904–5 of the Redruth School of Mines shows that a successful local effort is being made to provide practical scientific training in mining to those engaged in this important Cornish industry. The main object of the School of Mines is to provide theoretical and practical in-

struction in mining and the allied subjects essential to the training of competent mining engineers. The training in practical mining is given at the Basset Mines and at other mines in the locality, under the general supervision of an instructor. The practical underground work includes the timbering of shafts and levels. Students are taught, in addition, the methods of prospecting for minerals in all positions, and are trained to detect favourable indications on the surface. They are shown by examples in the neighbourhood how to *costean* for lodes, and how to detect the effect of cross-courses and slides on the lodes. The differences between fissure veins, gash veins, and contact lodes are pointed out by examples; the manner in which the lodes are affected by passing through the different strata, and the effect the bearing of the lode has on its productiveness in certain districts. Studies are made of the maps of the neighbourhood, and opportunities afforded for examination of other mines now working, and for investigating, as far as possible, those that have been abandoned.

### SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, July 25.—M. Mascart in the chair.—On a functional equation: Emile Picard.—Chemical and geological study of some springs in the north of Madagascar: Georges Lemoine and Paul Lemoine.—On some facts relating to the observation of variations in the lustre of phosphorescent sulphides under the action of *n*-rays or analogous phenomena: E. Bichat.—The academy was invited to send delegates to the second International Botanical Congress at Vienna, to be held from June 12 to 18, 1905.—On a relation between the minima and maxima of sun-spots: Alfred Angot.—On the singularities of the equation

$$y' = A_0 + A_1y + A_2y^2 + A_3y^3 :$$

Pierre Bouteux.—On the absorption of gases by wood charcoal at low temperatures: Sir James Dewar.—The liquid air calorimeter is used to determine the heat liberated by the absorption of certain gases in charcoal, the volume absorbed being measured. With all gases except helium, the volume absorbed is greatly increased by low temperature. Absorption of gases with charcoal at low temperatures forms a good method of producing a vacuum.—On the nature of *n* and *n*<sub>1</sub> radiations, and on the radio-activity of the bodies which emit these radiations: J. Becquerel.—On the refraction of *n*- and *n*<sub>1</sub>-rays: J. Becquerel.—On the contemplation in a dark room of surfaces feebly illuminated by certain special lights. The case of objects of linear form: F. P. Le Roux.—The phenomena of magnetic viscosity in soft industrial steels, and their influence on the methods of measurement: Raymond Jouaust.—Magnetic exploration of the Gulf of Padirac: E. Mathias.—On the earthquake of July 13, 1904, in the central Pyrenees: E. Marchand.—On the discharge of electricity in the air at the summit of the Eiffel Tower during the storm of July 24: A. B. Chauveau.—On the form taken by thallos iodide on being deposited from solution: D. Gernez.—On radio-active lead, radio-tellurium, and polonium: A. Debierne.—Action of zinc on the tungstates of sodium: L. A. Hallopeau.—On the acid pyrophosphate of silver: J. Cavalier.—On the composition of the homologues of Schweinfurt green: Georges Viard.—The heat of formation of the trisulphides of antimony: MM. Guinchant and Chrétien.—On polishing and connected scientific phenomena: F. Osmond and G. Cartaud.—On vinylidimethylacetic acid: E. E. Blaise and A. Courtot.— $\beta$ -Oxyalkyl and  $\beta$ -oxyphenyl ethylene ketones. The action of hydroxylamine and phenylhydrazine: Ch. Moureu and M. Brachin.—The action of oxalacetic ether on aromatic aldehydes in the presence of  $\beta$ -naphthylamine: L. J. Simon and A. Conduché.—The action of acid chlorides on tertiary bases with an aromatic nucleus: V. Auger.—On the general arrangement of the nervous system in *Rissoa elata*, var. *oblonga* (Desmaret): G. Quintaret.—On the intracellular contents of the parenchyma of certain fruits: Wladimir Tichomirov.—On the anatomy of the tubers of *Euphorbia Intisy*: Marcel Dubard and Rene Viguiet.—Contribution to the study of blight in tobacco leaves: MM. Bouygués and Perreau.—Researches on the